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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,633	05/09/2006	Becky Ellington	US030461US	1422

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EXAMINER	
BRUTUS, JOEL F	

ART UNIT	PAPER NUMBER
3768	

MAIL DATE	DELIVERY MODE
12/08/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,633	ELLINGTON ET AL.	
	Examiner	Art Unit	
	JOEL F. BRUTUS	3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-15 rejected under 35 U.S.C. 103(a) as being unpatentable over Entrekin et al (US Pat: 5,305,756) in view of Okunuki et al (US Pat: 5,460,179).

Regarding claims 1 and 8, Entrekin et al teach an ultrasonic transducer that comprises an array of elements actuated to produce scanning beams that is pertinent to the claimed invention [see column 2 lines 64-67 and column 3 lines 1-5]. Entrekin et al further teach timing of actuation of individual elements in the array develop an ultrasonic beam which is directed or steered in various directions in front of the array [see column 3 lines 5-10]; three-dimensional projection of echoes in the volumetric region with good lateral resolution [see column 5 lines 55-65].

Entrekin et al also disclose in figs 1 and 6, the transducer array (denotes 50) is swept in reverse direction, look at arrow 54 in fig 6 (emphasis added). In fig 1, the sweep arrow 16 which goes in both directions is an indication that array sweep in forward/backward and reverse directions (emphasis added).

With regards to position actuator, Entrekin et al don't specifically mention a position actuator couple to the array.

However, Entrekin et al teach actuating the elements to sweep and scanned in various directions such as azimuth and elevation [see column 3 lines 5-10 and fig 1-7].

There must be an actuator that couples to the array in order to activate the elements (emphasis added).

With regards to a transmitter, it acts as an oscillator or any driving mechanism or actuator. Entrekin et al teach the transducer is oscillated back and forth to scan the volumetric region [see column 5 lines 63-65]. Entrekin et al also disclose actuating a set of sub-elements first to scan on one direction and another set of sub-elements to scan in another direction [see column 6 lines 5-15].

There must be an oscillator that activates the array elements to transmit beams (emphasis added). As disclosed above, a first set of elements can be actuated to transmit a sequence of beams in azimuth direction and another sequence of beams in another direction (emphasis added and see figs 1-7 where the array is swept in reciprocating directions).

Entrekin et al teach in FIG. 3 a series of elements aligned in the azimuthal direction and each element in the azimuthal direction is sub-diced in the elevational direction. Three of these sub-elements 80a, 80b, and 80c are shown in FIG. 7.

Entrekin et al teach the times of actuation of the sub-elements control beam divergence in the elevational direction. For example, in FIG. 7 sub-element 80b would be actuated first, followed in rapid succession by sub-elements 80a and 80c [see column 6 lines 9-30].

However, Okunuki et al teach a transducer unit having an array transducer composed of a plurality of transducer elements; a rocking mechanism for rocking the transducer unit angularly about a virtual rotative axis and a driving mechanism for reciprocating moving the transducer unit [see abstract [see abstract].

Okunuki et al also teaches in fig 6-7, the transducer is sweeping in forward/reverse direction [see figs 6-7). Okunuki et al also teach a three-dimensional echo data acquiring region can be produced based on the shift of the electronic scanning plane which is affected by the rocking movement of the transducer unit [see abstract].

Therefore, one with ordinary skill in the art at the time the invention was made to combine these references by using the driving mechanisms and/or rocking mechanism as taught by Okunuki et al to cause the array to transmit beams; for the purpose of activating the transducer to apply ultrasonic beams as desired.

Regarding claim 13, all other limitations are taught as set forth by the above teaching.

Entrekin et al in fig 2, 3, 5-7 in elevation direction the n elements of the array would scan a sequence of scan planes [see column 3 lines 20-30]; the elevation and azimuth directions can be used as first or second side and vice versa, scanning a sequence of scan planes from first to second sides as the array is swept in forward or reverse direction as taught above (emphasis added).

Regarding claims 5 and 14, all other limitations are taught as et forth by the above combination.

Entrekin et al teach a plurality of parallel planar slices of the body must be scanned in order to gather a complete data set [see column 2 lines 6-8].

Regarding claims 2-4, 6-7, 9-12 and 15, all other limitations are taught as set forth by the above combination.

Entrekin et al don't explicitly mention left and right.

Entrekin et al further teaches the transducer is oscillated back and forth to scan the volumetric region in front of the transducer through oscillation of the shaft to which it is attached. The oscillatory motion is indicated by the arrow 54 [see fig 6] which indicates that the array can go left or right (emphasis added0

Okunuki et al further teaches in fig 1-2, a transducer unit is adapted to be movable reciprocatingly in the right and left directions (the arrow directions A in FIG. 1) within the casing [see column 1 lines 57-65].

Okunuki et al further teach as shown in FIG. 1 the transducer unit is adapted to be movable reciprocatingly in the right and left directions (the arrow directions A in FIG. 1) [see column 1 lines 57-65]. Okunuki et al teaches scanning in parallel scan planes [see figs 1-2].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine the Entrekin et al and Okunuki et al references; for the purpose of provide complete coverage of the volumetric region.

Response to Arguments

3. Applicant's arguments filed 8/28/2009 have been fully considered but they are not persuasive.

The claim objection and the 112 rejection are moot due to the amendment.

Applicant argues that Okunuki et al don't teach the beam direction is reversed or changed.

However, Okunuri et al show in figs 2, 4, and 6-7 that the array can be sweep in reverse direction.

However, Entrekin et al also disclose in figs 1 and 6, the transducer array (denotes 50) is swept in reverse direction, look at arrow 54 in fig 6 (emphasis added). In fig 1, the sweep arrow 16 which goes in both directions is an indication that array sweep in forward/backward and reverse directions (emphasis added).

Applicant also argues that Entrekin et al use a single element array.

Examiner disagrees because Entrekin et al teach an ultrasonic transducer that comprises an array of elements actuated to produce scanning beams that is pertinent to the claimed invention [see column 2 lines 64-67 and column 3 lines 1-5]. Entrekin et al further teach timing of actuation of individual elements in the array develop an ultrasonic beam which is directed or steered in various directions in front of the array [see column 3 lines 5-10].

Applicant also argues that Entrekin et al don't have to move their array for scanning.

Examiner disagrees because Entrekin et al teach "as the oscillatory motion moves the transducer will insonify the volumetric region" [see column 5 lines 65-67].

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL F. BRUTUS whose telephone number is (571)270-3847. The examiner can normally be reached on Mon-Fri 7:30 AM to 5:00 PM (Off alternative Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. B./
Examiner, Art Unit 3768

/Long V Le/
Supervisory Patent Examiner, Art Unit 3768